Patent Claims

1. An optically pumped semiconductor laser device having
- a surface-emitting vertical emission region (1) and
- at least one monolithically integrated pump radiation source (2) for optically pumping the vertical emission region (1),

wherein the at least one pump radiation source (2) is set up and arranged in such a manner that the pump radiation enters the vertical emission region (1) in the form of partial bundles of radiation with different radiation directions so that the pump radiation and the fundamental mode of the vertical emission region (1) have an overlap which is suitable for the excitation of this fundamental mode.

2. The semiconductor laser device as claimed in claim 1, characterized in that the partial bundles of radiation come from different pump radiation sources (2) with different main radiation direction.

3. The semiconductor laser device as claimed in claim 2, characterized in that the pump radiation sources (2) are semiconductor lasers with a closed resonator which encloses the amplifier region.

4. The semiconductor device as claimed in claim 2, characterized in that the pump radiation sources (2) are edge-emitting semiconductor lasers.

5. The semiconductor laser device as claimed in one of claims 2 to 4, characterized in that the pump radiation sources (2) in each case have a resonator with at least one curved cavity end facet (3).

6. The semiconductor laser device as claimed in one of claims 2 to 4, characterized in that the pump

radiation sources (2) in each case have a resonator having at least one cavity end facet arrangement which consists of two straight cavity end facets (4) which are arranged at right angles to one another.

7. The semiconductor laser device as claimed in claim 6, characterized in that the two straight cavity end facets (4) are arranged in such a manner that the pump radiation is totally reflected on them in the resonator.

8. The semiconductor laser device as claimed in one of claims 2 to 4, characterized in that one or more of the pump radiation sources (2) have a folded resonator with two cavity end facets and at least one inner cavity facet (5).

9. The semiconductor laser device as claimed in claim 8, characterized in that the at least one inner cavity facet (5) is arranged in such a manner that the pump radiation is totally reflected on it in the resonator.

10. The semiconductor laser device as claimed in one of claims 8 or 9, characterized in that the cavity end facets are broken crystal facets and the inner cavity facets (5) are etched facets.

11. The semiconductor laser device as claimed in claim 1, characterized in that the partial bundles of radiation come from a pump radiation source (2), the radiation of which is conducted through the vertical emission region (1) several times in different directions.

12. The semiconductor laser device as claimed in claim 11, characterized in that the pump radiation source (2) has a resonator with a cavity end facet which consists of an etched facet parabolically curved

in the main radiation direction of the vertical emission region (1), the vertical emission region (1) being arranged in the focal point of the parabolically curved and etched facet.

13. The semiconductor laser device as claimed in claim 11, characterized in that the pump radiation source (2) is a semiconductor ring laser.

14. The semiconductor laser device as claimed in claim 13, characterized in that the resonator of the semiconductor ring laser has at least three inner cavity facets (5).

15. The semiconductor laser device as claimed in claim 14, characterized in that the at least three inner cavity facets (5) are arranged in such a manner that the pump radiation is totally reflected on them in the resonator.

16. The semiconductor laser device as claimed in one of claims 1 to 15, characterized in that the transition from the at least one pump radiation source (2) to the vertical emission region (1) is curved and is distinguished by a change in the index of refraction so that the pump radiation is focused in the vertical emission region (1).